

EXPLOSIVES SAFETY

Volume 7, Issue 2

Savanna, IL 61074-9639

March 1996

STANDARDIZATION AND COMMUNICATION

The #2 man stepped inside the doorway of the bunker after throwing his grenade and hearing an explosion during a bunker clearing exercise with fragmentation grenades. There was a secondary explosion, an unexploded grenade detonated, injuring three soldiers - one of them seriously.

Four months before, another live-fire exercise (LFX) took place. A grenade thrown into a bunker did not explode. The officer in charge (OIC), who witnessed the incident, closed the bunker and made the proper notifications. Range Control notified explosives ordnance disposal (EOD) of a reported unexploded M-67 fragmentation grenade on a "positive control" live-fire trench/bunker range. EOD responded, and a team was directed to the bunker where the grenade had been thrown. The team made multiple searches for the grenade but didn't find it. The EOD team leader initiated an area detonation using a C-4 charge hoping to generate a sympathetic detonation. The EOD team radioed Range Control, "EOD clear Range X." Range Control, though, had been informed that the team could not locate the grenade and interpreted the message to mean the range was clear. They reopened the range for operations. The range remained in operation for 4 months before this accident.

This accident reconfirms the absolute necessity of establishing effective communication through standing operating procedures (SOPs). Had SOPs been in effect delineating appropriate actions for known unexploded munitions, the range would have remained closed until the grenade was located. The soldiers would not have been allowed in the vicinity of unexploded ordnance. It is imperative that effective communications occur throughout all missions, including after-action reports. Appropriate reports and back briefs would have given the OIC the information he needed to make the decision to put the range back in operation.

by: Maj. Harold R. Barrentine
U.S. Army Safety Center
DSN 558-3712

OPERATIONAL LOAD

An operational load is the ammunition used day-to-day for the unit's mission. It can consist of 9mm, 5.56mm, 12 gauge shotgun shells, 40mm grenades, riot control agents, and other types of ammunition. Operational loads are found in military police units, security forces, interior guards, and units with similar missions.

To help keep the operational load good, **do not mix lots**. This automatically degrades its condition. An ammunition lot may be suspended from use for various reasons. Larger items have the lot number marked on them but there is not enough surface to mark lot numbers on small arms ammunition (SAA).

Keep the ammunition dry. If ammunition gets wet, wipe it down with a soft cloth and put it where air can finish the drying. It may tarnish, but this should not be a problem.

Do not wipe ammunition down with oil. Grit or sand could stick to the ammunition and affect the chambering or functioning.

Do not play around with your ammunition. Ammunition is designed to kill or disable; it can not distinguish you from the enemy.

by: Mr. Mike Rosales
Ft McPherson Safety Officer
DSN 572-3479

HAZARD DIVISION (HD) 1.3 PASSIVE STRUCTURAL SYSTEMS DESIGN GUIDE

The USATCES distributed report HNDED-CS-93-7, rev.1, 1 November 1994, a U.S. Army Engineering and Support Center, Huntsville (USAESCH)-developed guide for designing facilities using HD 1.3 materials. A need for guidance was recognized after a fatal accident involving the manufacture of infrared (IR) flare composition in a facility designed for use with HD1.1 materials. The gas pressure generated during the fire was unable to properly vent because of the nature of the facility's construction. This design guide is approved by the Department of Defense Explosives Safety Board (DDESB).

Technical questions about this document can be answered by Mr. Joseph Serena, USAESCH, commercial 205-895-1665. Additional copies are available at the USATCES, Explosives Safety Test Management Division, Savanna, IL 61074-9639.

by: Mr. Lyn Little
Industrial Specialist
DSN 585-8765.

AMMUNITION PAMPHLET FOR BOSNIAN DEPLOYMENT

As U.S. soldiers began deploying to Bosnia as members of Operation Joint Endeavor, the U.S. Army Defense Ammunition Center and School (USADACS) Logistics Review and Assistance Office (LRAO) was tasked by the Deputy Chief of Staff for Ammunition (DCS for Ammo) at U.S. Army Materiel Command (AMC) to prepare a soldier's guide. This guide was for the safe care, transportation, and handling of ammunition and explosives tailored to the conditions of the Balkan environment. An LRAO Pamphlet, "Ammunition Operations in the Balkans," resulted.

Explosives safety is the dominant theme of this publication. A full range of ammunition logistics operations is covered. It provides information to the soldier in non-technical language for practical, every day use. Among other topics, the illustrated pamphlet includes sections on safe care and handling of Depleted Uranium (DU) munitions, a German/Bosnia weather comparison chart, safety tips, and serviceability information for each "family" of munitions, equipment, supplies, and publications lists, and an in-the-field-oriented motor vehicle inspection checklist.

by: Mr. Donnie L. Graves
QASAS
DSN 585-8052

TRANSPORTATION OF HAZARDOUS MATERIALS

As the Army continues to reduce its force level and base support, the movement of ammunition and explosives has increased to near wartime level. Force level reduction overseas requires the return of ammunition while the Base Realignment and Closure (BRAC) process continues to close ammunition plants and depots. A new mix of force structures will cause Forces Command (FORSCOM), U.S. Army training and Doctrine Command (TRADOC), and National Guard Bureau (NGB) installations to restructure their ammunition needs. The remaining depots are being tiered to support future conflicts. These movements could equal or surpass the amount of ammunition moved during Operation Desert Shield and Desert Storm.

More ammunition and explosives are being shipped than ever before. There has been an increase recently in near misses. The effects of an incident involving ammunition and explosives are potentially catastrophic. We need to reinforce safety efforts to ensure the safety of soldiers, families, civilian work force, contract personnel, and general public.

Department of Transportation (DOT) regulations, Title 49, Code of Federal Regulations (CFR), govern the shipment of DOD hazardous materials, including ammunition and explosives, by common carrier. Organizations and individuals involved in transportation operations of hazardous materials should review their procedures and give the following special attention:

- Review AR 385-10, Army Safety Program; AR 385-64, U.S. Army Explosives Safety Program; DAP 385-64, Ammunition and Explosives Safety Standards; and AR 55-355, Defense Traffic Management.
- Select appropriate equipment.
- Inspect military and commercial highway vehicles IAW 49 CFR 396, Sections 3-17.
- Adhere to maintenance standards IAW 49 CFR 393/397 (Motor Carrier Safety Regulation).
- Assure compatibility and segregation of loads IAW 49 CFR 174.81 (Segregation of Hazardous Materials).
- Use AMC 19-48 series procedural drawings.
- Comply to hazard communication standards IAW 49 CFR 172, Subparts D-G.
- Train IAW 49 CFR 172.704 (Training Requirements).

Planning transportation operations is critical. The probability of an incident is low when training, inspections, and proper markings are complete. Take time now to review your transportation operations and renew your commitment to explosives safety.

by: Mr. Stephen H. Hadley
Safety and Occupational Health Specialist
DSN 585-8708

JHCS HAS BEEN IMPROVED

The Proper Shipping Name (PSN) is determined by the United Nations (UN) Number. We now include the PSN in a separate field. This allows us to be specific when options or choices are given by the Hazardous Material Table in the Title 49, Code of Federal Regulations (CFR).

These are the words you will find in the JHCS PSN field when you use the Perform Query search method (selection number 5 on the main menu screen). A listing will not include the PSN separately, but show the complete Proper Shipping Description which includes the PSN.

Since we are providing the PSN, we also need to give you the technical name when it is required by the PSN. These are the PSNs that contain the abbreviation: N.O.S. (Not Otherwise Specified). A field for the technical name is furnished as part of the JHCS. We will now specify the technical name for PSNs with N.O.S. when we add new records to the JHCS.

With nearly 14,000 existing total records, we have a BIG job ahead. We ask your patience while we work to find and fill in the missing data. In fact, if you know of or can help us with technical names, we would appreciate hearing from you.

Similarly, we have a large job ahead with the PSN. Although the PSN field is not empty, many records contain more information than they should. Now, we need to go back and delete the extras.

We have added a "Net Explosives Weight" (NEW) field. This is the sum of High Explosives Weight (HEW) and Net Propellant Weight (NPW) to get the value needed for transportation. The weight fields are:

- HEW. The weight of all the Class/Division 1.1 material in the item.
- NPW. The weight of all the Class/Division 1.3 material in the item.
- NEW. The sum of the HEW and NPW, i.e. all Class 1 material. The NEW is the value to be used for transportation purposes. For JHCS items classified by predominate hazard as other than Class 1, the value is again all Class 1 material. For non-regulated items, the value will be zero.
- Net Explosives Weight for Quantity-Distance (NEWQD). This value is normally the sum of HEW and NPW, but may be reduced when testing show a propellant contribution less than its total weight. The NEWQD is the value to be used for storage purposes. For Classes other than 1, the value will be zero. For non regulated items, the value will be zero.

The kilogram weight fields have been changed to a numeric type field. This will allow groupings, e.g. all Class/Division 1.2 items with a weight less than 0.5 kilograms. Attempting to do the same in the pound weight fields which have a character format won't work because the decimal gets converted to a special character (we don't know what). We left the pounds as a character field so we could insert CLASSIF; meaning the value is classified.

The Department of Transportation (DOT) shipping labels now reflect the UN system, not the old Class A, B, and C system. We didn't delete the existing data for the old system; we just don't display it anymore. If you intend to use the old system and the item was put into the JHCS prior to 1991, we can retrieve the data upon your request. Note the Storage Compatibility Group was renamed to Compatibility Group. This was done since both the transportation and storage functions use the element. We hope you prefer the revised and improved JHCS.

by: Mr. Mark W. Skogman
Safety Engineer
DSN 585-8758.

SUBSTANTIAL DIVIDING WALLS (SDWs) RESEARCH AND RECENT DEVELOPMENTS

During the 1960's, an explosives limit of 425 pounds was introduced for explosives separated by a 12-inch concrete SDW to prevent, control, or delay the propagation of an explosion between quantities of explosives on opposite sides of an SDW. Data developed during the last 30 years do not support the simple application of this limit. According to available test data, the probability of explosives propagation through 12-inch concrete SDWs depends largely on two factors: (1) the velocity and mass of the wall fragments produced by a detonation and (2) the sensitivity of the explosive acceptor.

A study was initiated by the U.S. Army Engineering and Support Center, Huntsville (USAESCH), to evaluate the performance of 12-inch concrete SDWs. The study's primary goal was to more accurately define the capacity and response of the wall under blast loading. As a part of this study, hydrocode analyses were performed on typical 12-inch concrete dividing walls subjected to blast loadings from bare explosives charges. The analyses provided estimates of the velocity of wall fragments produced by an explosives detonation in a typical manufacturing or storage bay. Analyses were performed for six charge weights, ranging from 50 to 425 pounds TNT, and two support conditions.

Research efforts continue at the Naval Facilities Engineering Service Center (NFESC) and the Army Research Laboratory (ARL) to identify the more sensitive "worst case" explosives acceptors. As expected, acceptors with a heavy casing generally appear to be less sensitive to secondary fragment impact than acceptors with a thin casing. From this effort, potential explosive acceptors have been divided into eight storage groups. It is anticipated that these groups will provide the framework for the development of future explosives limits for 12-inch SDWs.

To accurately define groups of acceptors and donors classes, the USAESCH will recommend that a follow-on limited test program be conducted.

by: Mr. Robert H. Davidson
Safety Engineer
DSN 585-8627.

INTERIM LEASING OF ORDNANCE AND EXPLOSIVES (OE) CONTAMINATED LAND

A current trend in the disposal of surplus government real estate, is to lease the property prior to cleanup and final disposal. At first, the contamination was usually some type of hazardous, toxic or radiological waste (HTRW), but now, OE contaminated land is being proposed for lease. DOD defines an interim lease as a "short-term lease that makes no commitment to the Lessee for future use or conveyance of title to the property to the Lessee upon its disposal." Interim leases can be for a period of one to five years, with options for renewal.

Installations scheduled for closure may consider interim leasing of OE contaminated land as a way for local communities to begin using property before a final disposal decision and before cleanup has been completed. It is a procedure that can allow reuse to proceed, even when money for immediate cleanup may not be available. The problem for the ammunition community, is that the OE hazard remains, and must still be dealt with, both during the lease and during the cleanup.

Interim leasing is probably not a feasible option in most cases of OE contaminated property. The property in question must be able to be safely used by the lessee prior to cleanup, and procedures must be worked out in advance to assure that when the cleanup is

begun, it can be performed safely and efficiently. This means that the OE hazards must be clearly understood, and positive safeguards must be in place to protect the public from those hazards. In a case involving Tipton Army Air Field (TAAF), safeguards would have involved restricting access to unpaved areas of the airfield property and numerous shutdowns of the airport during the cleanup. These restrictions may have been the reason the county decided to delay taking control of the airfield until after the completion of the cleanup.

An approved safety submission is required prior to an interim lease of real property contaminated or potentially contaminated with OE, just as it is for final disposal of such property. This is a time consuming process, so it should be prepared as far in advance of the proposed lease date as possible.

by Mr. Jim Toburen
QASAS
DSN 585-8784

U.S. NAVY PROPERTY CONTAMINATED WITH ORDNANCE AND EXPLOSIVES (OE)

The USATCES has recently begun preparing an Archives Search Report (ASR) on real property owned by the U.S. Navy contaminated with ammunition, explosives, or chemical agents. All previous ASRs have been prepared on Formerly Used Defense Sites (FUDS). Our first foray into this area is the Carrizo Impact Area located in Imperial County, California. This site is an impact area, but contaminated real property may also include firing ranges, ammunition manufacturing plants or disposal areas such as pads, pits, basins, ponds, streams, and burial sites. Much like a FUDS, this impact area has not been actively used for over 35 years. The investigation of this site has required extensive coordination with elements of the San Diego Division of the Naval Facilities Engineering Command, the Naval Air Facility at El Centro, California, and the project manager, the Los Angeles District of the United States Army Corps of Engineers (USACE). The USATCES has a long standing partnering relationship with the USACE on OE projects. The task for the USATCES and the USACE is to identify the potential degree and extent of OE contamination and research possible final end uses for the land. For this we turn to collection of historical records and interviews, which help prepare for the eventual onsite investigation, actions for which the USACE and USATCES have expertise based on ASR preparation and assessment of hundreds of FUDS.

A final remediation plan will be formulated by the designated Navy command. The guiding principle is that real property known to be contaminated with OE must be decontaminated with the most appropriate technology to ensure protection of the public consistent with the proposed end use of the property. All procedures developed to safely remediate this site will be submitted to the Department of Defense Explosive Safety Board (DDESb), through the Naval Ordnance Center (NOC), for review and approval.

The project requires a lengthy step by step process, but the one overriding lesson learned so far is that all involved organizations, regardless of service, have as their central concern protection of the general public from exposure to hazards. (Anyone having knowledge of the operations conducted at the former Carrizo Impact Area should contact Joe Jennings or Larry Dauphin at USATCES).

by: Mr. Joe Jennings
QASAS
DSN 585-8019

**DEFENSE ENVIRONMENTAL RESTORATION
PROGRAM (DERP) FOR FORMERLY USED
DEFENSE SITES (FUDS) AND BASE
REALIGNMENT AND CLOSURE (BRAC)
INSTALLATIONS - 1996**

The USATCES asks anyone having information on the following installations to forward information, materials, or suggestions to: Director, U. S. Army Technical Center for Explosives Safety, ATTN: SIOAC-ESL, Savanna, IL 61074-9639:

Camp Coxcomb; Freda, CA
Jenner Radar Site B-76; Sonoma County, CA
Desert Center Division Camp; Desert Center, CA
Camp Granite; Freda, CA
Bolsa Chica Military Reservation; Bolsa Chica, CA
Victorville PBR #1; Victorville, CA
Victorville PBR #13; Lucerne Valley, CA
Victorville PBR "Y"; Barstow, CA
Soda Lake ATG Gunnery Range; Taft, CA
Kirtland AFB Demolition Bomb Range; Grants, NM
Kirtland AFB PBR #S-14; Albuquerque, NM
Roswell/Walker AFB, PBR #12; Roswell, NM
Roswell/Walker AFB, PBR #13; Roswell, NM
Fort Fisher; Kure Beach, NC
Greensboro AAF Rifle Range; Brown Summit, NC
Corolla Naval Target; Corolla, NC
Big Bay AAA Range; Big Bay, MI

Alpena NG Target Range; Alpena, MI
Owosso NG Target Range; Owosso, MI
Saginaw NG Target Range; Saginaw, MI
Kalamazoo NG Target Range; Kalamazoo, MI
Big Rapids NG Target Range; Big Rapids, MI
Jackson NG Target Range; Jackson, MI
Camp River Rouge Park; Detroit, MI
Wabaunsee PBR #2; Topeka, KS
Bayhawk Ordnance Works; Crestline, KS
Liberal AAF; Liberal, KS
Hutchinson NAS; Yoder, KS
Casper PBR #4; Casper, WY
Split Rock ATG Gunnery Range; Casper, WY
Creeds NAS; Virginia Beach, VA
Fort Lee Artillery Range Site; Fort Lee, VA
Plum Tree Island Range; Poquoson, VA
James River Shipbuilding; Richmond, VA
Fort Lauderdale Bomb Target #1; Fort Lauderdale, FL
Fort Lauderdale Bomb Target #5; Fort Lauderdale, FL
Panama City Harbor Defense; Bay County, FL
Aloe Army Airfield; Victoria, TX

by: Mr. Larry Dauphin
QASAS
DSN 585-8867